

Butterfly Inventory at Jewel Cave National Monument and Mount Rushmore National Memorial.

PRINCIPLE INVESTIGATOR:

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PROJECT STATEMENT:

Jewel Cave National Monument is a 1,355-acre park located in the south-central Black Hills. The climax community of the park is ponderosa pine forest; however, a recent fire has burned much of the park resulting in a mosaic of meadows, dead ponderosa pine, and live ponderosa pine. Mount Rushmore National Memorial is a 1,238-acre located in the east central Black Hills. The park consists of ponderosa pine forests, some of which are in old growth condition, interspersed with small stands of aspen and birch. Several small streams and one beaver pond occur in the park. Neither of these parks currently have a comprehensive list of butterfly species within the park. To rectify this deficiency, a butterfly inventory is needed. This scope-of-work (SOW) describes the need, objectives, methods, budget, and products for such an inventory.

The Principle Investigator or people working on their behalf will contact park staff prior to conducting field work at the park (contact the Northern Great Plains Network I&M Coordinator for a list of park contacts).

OBJECTIVES:

The objectives for the project are:

- Conduct a butterfly inventory at the park that documents as many species as time will allow.
- Make a qualitative assessment of the abundance of each species.
- Record the location of species listed as endangered, threatened, or species of concern by the federal government or the state of North Dakota, and/or species deemed otherwise noteworthy (e.g., notable edge of range species) in the judgment of the investigators.
- Conduct a cursory review of habitat conditions and management activities.

METHODS:

The investigator will adequately cover all habitat types in the parks and document all butterfly species observed. For purposes of this study butterflies are defined as members of the superfamilies Papilionoidea and Hesperioidea (i.e., the order Lepidoptera, but excluding the moths). Identification shall be to the species level at a minimum.

The investigator will use standard butterfly inventory procedures to identify and document species. Visual observation of unrestrained butterflies will suffice for easily identifiable species. When appropriate, specimens will be handled for identification purposes. And when necessary, vouchers may be collected for identification, contingent on park approval (vouchers may also be collected for scientific purposes [e.g., museum collections], contingent upon approval of the park). Vouchers remain property of the National Park Service, but can be kept off site under a permanent loan (see the Network I&M Coordinator for more information).

The investigator will use his professional judgment in terms of habitats to search and the amount of effort to invest in each habitat and region of the park units. It is anticipated that all habitats will receive some level of search effort.

At least three visits should be made to each park to capture the different emergent periods between species. For example, visits may be made in May, July, and September. If, in the opinion of the investigator, additional visits are needed, or three visits are not warranted, they should consult with the Network I&M Coordinator. Each visit should consist of a minimum of 4-6 hours of field work. The proposed budget for the project provides for 3 separate visits to each park by the Principle Investigator and an assistant, with

each visit consisting of 4-6 hours of field work. The balance of the time is for travel and for the Principle Investigator to prepare for the project and write a final report.

A qualitative estimate of abundance shall be made for all butterfly species observed. The categories to use shall be; abundant, common, uncommon, and rare (the I&M Coordinator can provide detailed definitions). This estimate should be very subjective and should not detract from the effort made to document additional species.

Location information (preferably using GPS units with UTM coordinates and NAD 83 datum) will be recorded for species listed as endangered, threatened, or species of concern by either the federal government or the state of North Dakota, and/or species deemed otherwise noteworthy (e.g., notable edge of range species) in the judgment of the investigator.

The final report shall include a list of all species documented for the park. The list should identify those species documented by visual observation in the field and those species documented by a voucher collection. An analysis of the completeness of the surveys should be included in the report. The final report should also include a list of species that may have been extirpated from the site. The final report should also include management recommendations or issues, e.g., recommendations for fire. A recommended final report outline is included as an Appendix to this SOW.

The Principle Investigator will need to comply with National Park Service policies and permit requirements including the procurement of a park research permit (apply online at <http://science.nature.nps.gov/research/> or contact the park or the Network I&M Coordinator for more information).

PRODUCTS:

- A digital copy of a final report, preferably in MS Word. The final report shall be in standard scientific format including an introduction, methodology, results, and discussion. The investigators are encouraged to use the report template listed in the appendix of this SOW.
- Pictures of butterflies, field investigators, and habitats are appreciated, however, they are not required as part of this project.

PROJECT SCHEDULE:

June-September 2004. Conduct field studies.

December 31 2004. Deadline for Principle Investigator to submit to the Network I&M Coordinator all products identified above (unless otherwise directed by the Network I&M Coordinator).

BUDGET:

Expense	Total
Principle Investigator (58 hours @ \$30/hr)	1740
Assistant (48 hours @ \$8/hr)	380
Supplies	5
Transportation (1,000miles at \$0.375 per/m)	375
Total	2500

APPENDIX

Inventory of Butterflies at Jewel Cave National Monument and Mount Rushmore National Memorial.

Final Report

By:

**John Doe
University of Excellence
Somewhere USA**

**Jane Doe
More Excellent State
Somewhere USA**

Add a picture if you'd like

**Submitted to:
Northern Great Plains Inventory & Monitoring Coordinator
National Park Service
Mount Rushmore National Memorial
Keystone, South Dakota 57751**

December 31, 2004

Executive Summary

Make this section a paragraph or two. Simply a brief overview of the project as a whole i.e., when and where conducted, by who, objectives, overall results, overall assessment of completeness, and health of park ecosystems in regards to taxa.

JEWEL CAVE NATIONAL MONUMENT

Intro and Methods

Items to include are:

Habitats/Locations Surveyed

Survey Method Used and Effort (e.g., hours, trap nights)

Dates

Observers

Results and Discussion

List species documented. List evidence type (observation or voucher). List relative abundance.

List species not documented but possibly present.

List species that may be extirpated from the site.

Overall assessment of the inventory.

Any other relevant comments or lists, including other taxa observed (e.g., we can always use more herp reports), weather conditions, known records near the park, etc.

Recommendations to Park Management

Long-term Monitoring Recommendations, if any (methods, indicator species, habitats, etc.)

List species the park should be especially concerned about because they are T&E, regionally rare, a species of concern, etc.

Describe habitat enhancement or other conservation recommendations

List potential impacts to species such as visitors, prescribed fire, roads, and mitigating actions

Vouchers Collected and Repository

For each voucher taken list voucher date, collector, approximate location, micro-habitat (e.g., in pond, under a rock), and other relevant information

MOUNT RUSHMORE NATIONAL MEMORIAL

Repeat items listed above